

Solar Radio Bursts and Space Weather

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Radio bursts from the Sun are produced by electron accelerated to relativistic energies by physical processes on the Sun such as solar flares and coronal mass ejections (CMEs). The radio bursts are thus good indicators of solar eruptions. Three types of nonthermal radio bursts are generally associated with CMEs. Type III bursts due to accelerated electrons propagating along open magnetic field lines. The electrons are thought to be accelerated at the reconnection region beneath the erupting CME, although there is another view that the electrons may be accelerated at the CME-driven shock. Type II bursts are due to electrons accelerated at the shock front. Type II bursts are also excellent indicators of solar energetic particle (SEP) events because the same shock is supposed accelerate electrons and ions. There is a hierarchical relationship between the wavelength range of type II bursts and the CME kinetic energy. Finally, Type IV bursts are due to electrons trapped in moving or stationary structures. The low-frequency stationary type IV bursts are observed occasionally in association with very fast CMEs. These bursts originate from flare loops behind the erupting CME and hence indicate tall loops. This paper presents a summary of radio bursts and their relation to CMEs and how they can be useful for space weather predictions.